POVERTY ASSESSMENT
Social Protection Chapter
Background paper 5

Health insurance
Use of health care services by the poor
efficiency and equity issues
in the province of Kon Tum

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One of the important political goals in the coming years is the achievement of universal coverage of health insurance. For that purpose the government is pursuing the strategy (started in 2005) to provide free health insurance cards to all the poor, the ethnic minority populations and the persons living in remote or mountainous areas. In 2008, the State budget transferred to the Vietnam Social Security for that purpose represented about 23.2% of VSS health insurance income from contributions (about 2 217 VND billion on a total of 9 561 VND billion, see Table 1).

These transfers aim at equalizing opportunity of access and receipts of health care services. Aggregate indicators on health insurance expenditures suggest that the system is still far from achieving these two goals, however. VSS aggregate figures on health insurance expenditures indicate that the use of health care units by the subsidized populations is much lower than by the rest of the population. While the subsidized groups represented about 41% of the population of the insured in 2006, they represented only 12.4 % of the total health expenditures reimbursed by health insurance. In average, they visited health care units 3 times less than the rest of the population and they were hospitalized 2 times less often than the rest of the population. They also likely received services of lower quality. In 2006, the average cost of a hospitalization (in-patient visit) of a person from the subsidized populations was 419 thousand dong; it was equal on average to 878 thousand dong for the rest of the population. Similarly, the average cost of an out-patient visit was 28 thousand dong for the subsidized populations and 48 thousand dong for the rest of the population. In 2008, this gap had not reduced. The average benefit received by the poor was equal to 122 608 VND while the average for all the insured was of about 258 146 VND (see Table 1).

[1] Comments and questions are welcomed at paulettecastel@gmail.com

Table 1 Health Insurance Contribution Incomes and Benefit Payments				
Groups	**2007**	**2008**	**2007**	**2008**
	Number of active members (person)		**Contribution Income (VND million)**	
Compulsory	11 346 401	13 442 738	4 283 108	5 690 485
Poor	15 170 312	15 829 327	1 173 122	2 217 351
Students	8 042 960	7 487 450	562 170	830 768
Voluntary	2 298 329	3 153 720	269 481	823 076
Total	**36 858 002**	**39 913 235**	**6 287 881**	**9 561 680**
	Benefit payment (VND million)		**Benefits per member (VND)**	
Compulsory	4 464 545	6 071 585	393 477	451 663
Poor	1 378 063	1 940 800	90 839	122 608
Students	615 555	519 476	76 533	69 380
Voluntary	1 653 923	1 771 573	719 620	561 741
Total	**8 112 086**	**10 303 434**	**220 090**	**258 146**

Source: VSS

Under insurance principles, it is expected that the lower spending of the healthy finances the higher spending of the sick. It would be very surprising, however, that such difference in health status explains the gap in spending observed between the subsidized groups and the rest of the population. Consequently, the larger funds transferred by the State to provide health insurance to the subsidized groups have possibly helped improve the access and the quality of health care services to the better-off instead of facilitating a better provision of care to the subsidized populations. The Joint Annual Health Review of 2007 suggests that "the health insurance fund from poor regions has subsidized health care in major cities and wealthy provinces".

Health insurance is expected to narrow the difference in health expenditures due to prices. Differences in health expenditures depend also on preferences and educational and other barriers. It is often cited that cultural background or underestimations about the seriousness of illness explain the lower use of health care facilities by people of ethnic minorities. Barriers like distance, difficulties to travel on roads of very bad conditions or economic constraints[2] are also mentioned to explain the low frequentation of the poor of remote areas. The incapacity to the poor to pay for costs not covered by health insurance (including some drugs, materials, IVs etc.) is also mentioned as a factor reducing the access of the poor to health care.

Many of these explanations are rational, but little is known about their relative importance and their effective impact on people's health seeking behavior and access to treatment.

[2] For example, the income shock - foregone income - that is associated to the realization of a visit at a health care facility

This study investigated these issues through the analysis of individual's health insurance data of the Provincial Social Security (PSS) Heath Insurance of Kon Tum. The research gathered all the information collected for claim control purposes at the provincial and districts offices of Kon Tum in the year of 2008[3]. When combined with the database of the insurance cards, these data allow analyze the patterns of access and use of health care services of the population of Kon Tum. The use of this database has several advantages over the use of VHLSSs' information. First, the VSI is the only database that gives information on the use of the health insurance funds. While VHLSSs provide information on the costs not covered by health insurance, this database can give insights about government transfers' social impact. Second, the VSI database informs about the disease and the types and costs of the services provided to each patient. Third, the VSI database covers much wider populations than the VHLSSs that collect only data on representative samples. One consequence of this is that VSI information gives the opportunity to understand better the attitude of the members of the ethnic minorities toward health care. Such analysis is difficult with VHLSSs' samples because the ethnic minorities are relatively small groups at the national level and the VHLSSs do not include enough observations.

1. The databases

The study merged two databases: the database on patients' visits collected for claim control and reimbursement purpose and, the database on the insured that is used to issue the health insurance cards[4].

1.1 The database on patients

Although the procedures to record patients visits on paper follow national standards, their electronic recording is still not realized in systematic ways and depends on districts' hospital and VSS local offices equipment in computers and staff capacities. In Kon Tum, almost all the out-patients visits at commune health care centers are not electronically recorded; and there are no records of the in-patients and out-patients visits realized at the district hospitals of Sa Thay and Tu Mo Rong. Recent changes in the software used to record the visits and lack of awareness of the utility to keep stored the electronic records of 2008 after the process of the revision of the claims was finished explain, furthermore, that there is no electronic files about the visits realized at the health care unit of the Rubber factory, the center of treatment of special diseases (TTYT phßng chèng bÖnh XH PCBXH) and two other special centers (TTYT Dù phßng tØnh and

[3] With a lot of support from Pham Anh Tuyet, Nguyen Thi Thu Phuong, and Tam Tran Ngo Minh (VASS, CAF).We would like to thank you Mr. Hung, Son, Hu? of the office of Kon Tum for their great help in that process.

[4] These databases were not made for research purpose and, the consolidation and the clean up of all the electronic files required a lot of work. Details on that process are available on demand at paulettecastel@gmail.com

ViÖn §iÒu d-ìng). Some of the data of the visits made during the first quarter of 2008 at the provincial hospital of Kon Tum are also missing.

Comparisons of the information included in the database of patients and the official figures about the total number of visits and the total amount of health expenditures reimbursed by PSS Kon Tum (see Tables 2) indicate that the database covers relatively well in-patients visits and expenditures: 81.7% of the visits and 84.9% of the fees. The coverage of out-patient services is much lower: 45.8% of the visits and 35.4% of the fees, because almost all the visits made at health commune centers are not recorded electronically. If these visits are excluded the database covers 65.1% of the out patient visits and 64.6% of the out patient expenditures.

Table 2: Comparison between expenditures and visits database and Kon Tum administrative figures

Table 2a
Comparison in patients expenditures and visits [1/]

	Figures reported in PSS tables [1]			Reported in the database on patients		Ratio figures of the database on PSS figures	
Health unit	Share in total fees	Total fees VND mln	Number of visits	Total fees VND mln	Number of visits	Total fees	Number of visits
Dak Ha	3.9	542.5	2072	291.8	1149	53.8	55.5
Dak To	4.8	659.1	2341	659.7	2345	100.1	100.2
Ngoc Hoi	4.6	638.9	2238	968.1	3506	151.5	156.7
Dak Glei	3.2	441.7	1613	278.8	1042	63.1	64.6
Sa Thay	3.5	481.6	1563	0.0	0	0.0	0.0
Kon Plong	1.3	181.6	516	184.3	535	101.5	103.7
Kon Ray	2.0	279.4	1241	176.1	753	63.0	60.7
Tu Mo Rong	0.6	76.4	233	0.0	0	0.0	0.0
CT Cao Su	0.0	3.3	52	0.0	0	0.0	0.0
Dieu Dung	1.5	202.0	283	197.6	274	97.9	96.8
BV KT	74.5	10247.5	10301	8916.3	8732	87.0	84.8
Total	100.0	13754.1	22453	11672.8	18336	84.9	81.7

Note: 1/ includes expenditures and visits realized in the province of Kon Tum by patients registered in and out the province of Kon Tum.

Table 2b Comparison out patients expenditures and visits [1/]							
	District and Provincial		Commune level		Total		
	Total fees	Number of visits	Total fees	Number of visits	Total fees	Share in total fees	Number of visits
Dak Ha	980.8	17949	713.0	27848	1693.8	12.2	45797
Dak To	484.8	7120	529.8	22284	1014.6	7.3	29404
Ngoc Hoi	1167.4	19027	525.6	22106	1693.0	12.2	41133
Dak Glei	460.3	10586	716.8	27491	1177.1	8.5	38077
Sa Thay	455.8	9587	617.2	22804	1073.0	7.8	32391
Kon Plong	378.4	3085	445.5	14629	823.8	6.0	17714
Kon Ray	661.4	9993	277.9	13293	939.3	6.8	23286
Tu Mo Rong	235.3	3002	692.3	19556	927.6	6.7	22558
Thi Xa	32.0	490	751.7	24068	783.6	5.7	24558
CT Cao Su	47.7	845	99.4	3437	147.1	1.1	4282
PCBXH	107.0	2453	0.0	0	107.0	0.8	2453
Du Phong	79.9	1186	0.0	0	79.9	0.6	1186
Trung Cao	393.5	4323	0.0	0	393.5	2.8	4323
BV KT	2990.5	50115	0.0	0	2990.5	21.6	50115
Total	8474.7	139761	5369.1	197516	13843.8	100	337277

Note: 1/ includes expenditures and visits realized in the province of Kon Tum by patients registered in and out the province of Kon Tum.

Table 2c Comparison out patients expenditures and visits [1/]					
	Reported in the database on patients		Ratio figures of the database on PSS figures		
	District and provincial level		District and provincial level	Total	
Tinh & Huyen	Fees	Number of visits	Fees	Fees	Number of visits
Dak Ha	224.3	4320	22.9	22.7	23.9
Dak To	486.2	7133	100.3	65.3	45.8
Ngoc Hoi	940.7	15915	80.6	65.1	56.4
Dak Glei	513.0	12603	111.4	65.6	44.3
Sa Thay	0.0	0	0.0	0.0	0.0
Kon Plong	301.1	3900	79.6	57.5	45.4
Kon Ray	121.4	2189	18.4	48.3	26.6
Tu Mo Rong	0.0	0	0.0	0.0	0.0
Thi Xa	0.0	0		0.0	0.0
CT Cao Su	0.0	0	0.0	0.0	0.0
PCBXH	0.0	0	0.0	0.0	0.0
Du Phong	40.8	646	51.0	51.0	54.5
Trung Cao	393.5	4323	100.0	100.0	100.0
BV KT	2450.4	39901	81.9	81.9	79.6

Sum	5471.4	90930	64.6	45.8	35.4

1.2 The database on insured

PSS administrative data report 311 444 insured in Kon Tum at the end of 2008. The database established to produce the insurance cards includes, however, 821 905 records. The reason for this large number of records is that the database includes all the information on insured since the first electronic registration.

The database on which the study was selected on the following criteria:

- Only insured with a plausible year of birth was selected,
- Only insured with insurance cards of a validity period starting before 2009 and ending in 2008 or after was selected and,
- The insured for which the database on patient reports some expenditures in 2008 were also selected whatever the validity period of their insurance cards (42 123 records)

As a result, the database on insured the study uses includes 329 988 individuals. This number is 6% higher than the number of insured indicated in the PSS tables for the fourth quarter of 2008. The figures in Table 3 compare the distributions of the insured in the (cleaned) database and the PSS quarterly table of the fourth quarter of 2008. The database particularly overestimates the number of voluntary insured, students and pensioners and beneficiaries of social assistance. The number of the poor is also higher (by 2.9%).

Table 3
Comparison of the distribution by insurance status of the insured in the database on insured and PSS Table of the quarter 4 of 2008

	PSS figures quarter 4	Distribution	Database insurance cards [2/]	Distribution
Employed	35597	11.4	36311	11.0
Pensioners & meritorious people	4555	1.5	6712	2.0
Vulnerable groups	796	0.3	1195	0.4
Poor	237222	76.2	244074	74.0
Voluntary insured [1/]	33274	10.7	41696	12.6
	311444	100.0	329988	100.0

Note: 1/ Starting quarter 2, the PSS table includes in the group of the employed the dependents of the army. Before quarter 2, these dependents were included in the group of the students' voluntary insured. The figures reported for PSS for the voluntary insured includes an estimate of these insured.

Health insurance in Kon Tum covers about 91.8% of the population 6 years old and above[5]. The reason is such a large coverage is that the province is poor

[5] There are 311 444 insured and about 53639 children less than 6 years old directly covered by the Children Fund for a total population of 392822 persons.

and located in mountainous areas, so a large share of the population (76.2% of the persons above 6 years old) receives free health insurance cards. This particularity gives also the opportunity to realize comparison not only between the poor (or the subsidized populations) and the non poor but also between the poor themselves.

Three groups could be identified: (1) the persons who are likely receiving social aid. In the database, these persons are classified as belonging to a "T" category. The group is rather small (see Table 4). (2) The second group includes the members of the ethnic minorities. In the database, these persons are classified as covered by the decree 135-168[6]. (3) The third group includes the other persons that are notified as poor in the database. Because the whole province of Kon Tum is located in mountainous areas and as such about all the population, except the people who are working in the formal sector, is entitled to free health insurance. This group, therefore, most likely includes the farmers and the workers of the informal sector and their families. It is important to observe that the subsidized groups include populations with probably different social and economic status (extremely poor, poor, near poor and even some not poor people).

Table 4
Number of insured by poverty status

	Number	Share
Non poor	83,923	25.4
Poor recipients of social aid	6,658	2.0
Ethnic minorities	114,873	34.8
Informal sector	124,534	37.7
Total	329,988	100.0

1.3 Merging the two databases

When the data on the visits are merged with the database on the insurance cards, it appears that:

- 0.4% of the visits (423/109266) are done by insured registered out of Kon Tum.
- 3.8% of the visits done or reported as done by insured of Kon Tum [4104/(109266-423)] could not be matched with information in the database of the insured.

Table 5
Number of patients with insurance cards in Kon Tum

		Database on visits		
	Registered	out of Kon Tum	in Kon Tum	Total
Database on insurance cards	Not in file of insured	**423**	4104	4527
	In file of insured	41	104698	**104739**

[6] Ethnic minorities living in mountainous areas (Decision No. **168**/2001/QD-TTg and 186/2001/QDTTg); people living in disadvantaged communes (Decision No.**135**/1998/QD-TTg).

	Total	464	108802	109266

For probably data management problems 4104 patients who are supposedly registered in Kon Tum do not appear in the database of the insured and, imversely, 41 patients supposedly not registered in Kon Tum do have an insurance card in the database on the insured.

The database on the visits includes information on each patient's date of birth and gender. When compared to the date of birth and gender reported in the database on insurance cards, 104 042 visits (95.2% of all the visits) showed a good match on both criteria; 335 only matched on the year of birth, 326 only on the gender, and 36 didn't match at all.

Consequently, the database includes either 104 739 visits of patients of age and gender as reported in the database of insured and, 108 649 visits if all the visits for which the patients social security number could not be matched in the database of the insured are also included.

Figures 1 and 2 show that the distributions of the patients and the average cost per visit by age groups of the patients that perfectly match on gender and age with the file on the insurance cards do not differ significantly from the distribution by age groups of all the patients reported as being registered in Kon Tum.

Figure 1: Distribution of patients by age group (in and out patient visits)

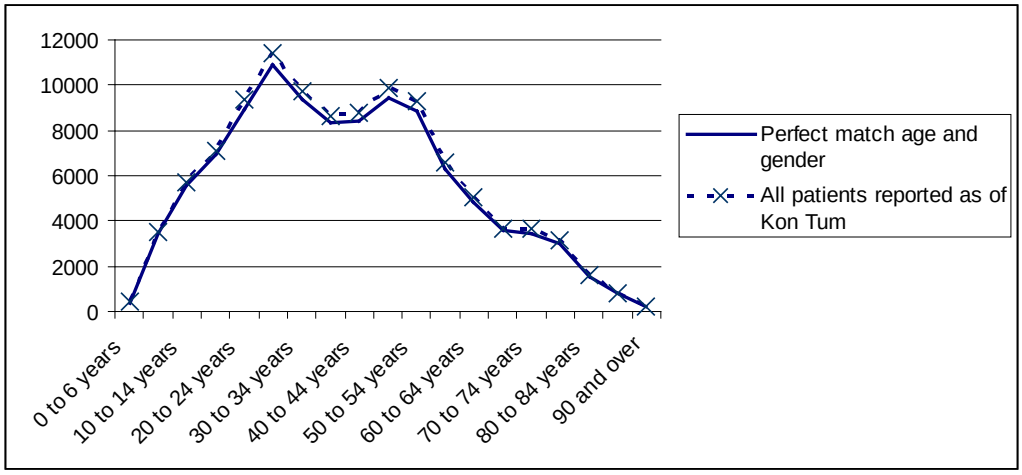
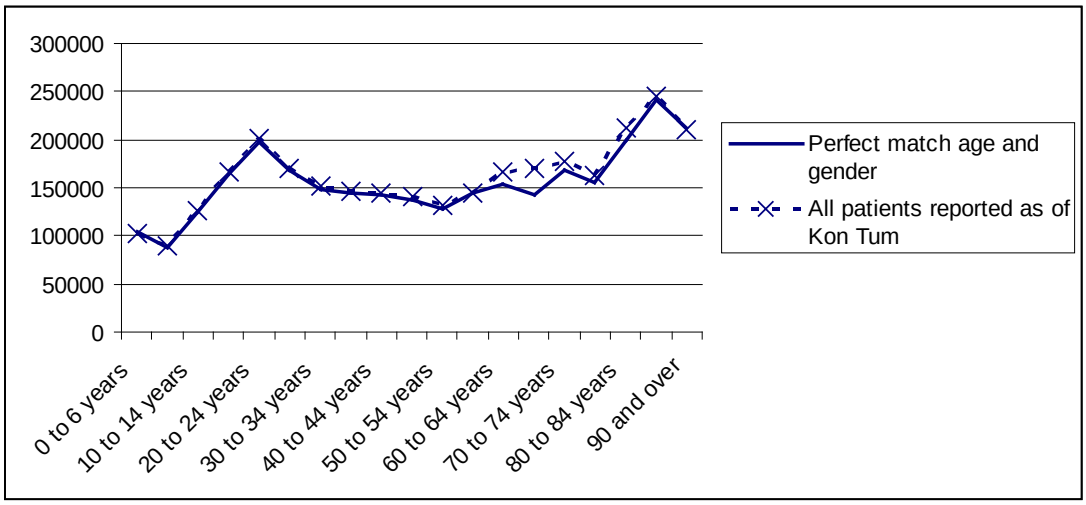


Figure 2: Average cost per visit (in and out patient visits)

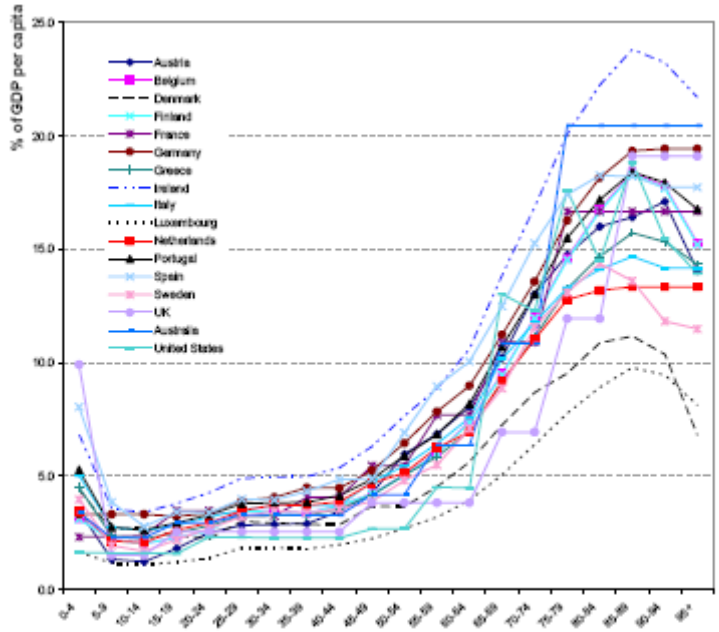


2. Average health fees per insured and age groups

Health deteriorates with age is a common pattern observed across all countries. As the international profiles reproduced in figure 3 indicate, the average health expenditures per capita increases regularly with age. Other similarities are that the average expenditure on infants less than 5 years old is relatively higher than the average expenditures reported for the other children (between 5 and 19 years). At very old ages the trend becomes flat or declines.

Figure 3 Public health care expenditure by age groups

Figure 2.1 Public health care expenditure by age groups [1]

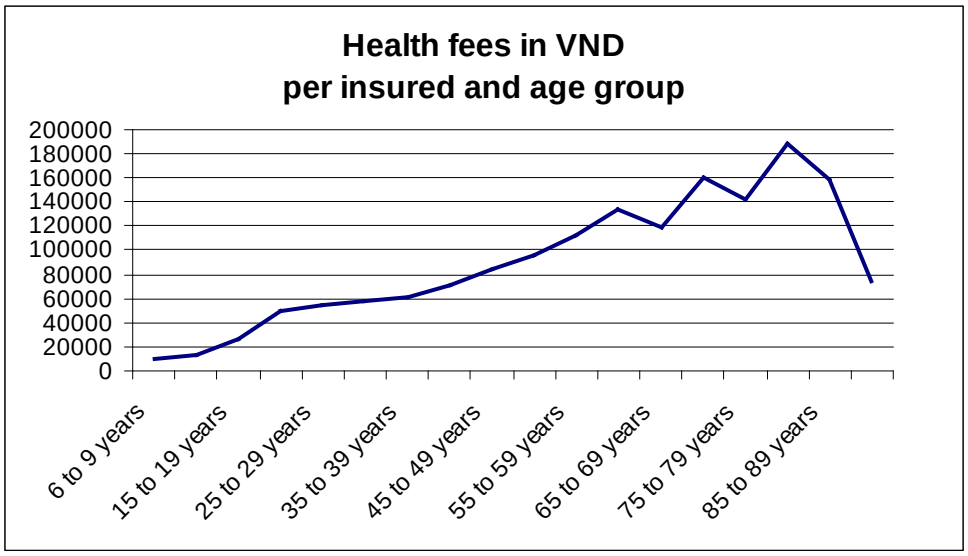


1. Expenditure per capita in each age group divided GDP per capita.
Source: ENPRI-AGIR, national authorities and Secretariat calculations.

Figure 4 represents the average health expenditures per insured observed in the province of Kon Tum: that is the total amount of expenditures by age group divided by the number of insured of the same age. The calculation does not include the children less than 6 years old because in 2008 all the infants were directly covered by the Children Fund[7]. To be exactly comparable to the profiles in figure 3, out-of-pockets payments at health care facilities should be added. A similar profile is, however, observed on the data of Kon Tum. The level or fees per insured regularly increases until the age of 64 and in an irregular way until the age of 84. It abruptly falls after.

Figure 4: total health expenditures reimbursed by health insurance per insured by age groups

[7] According to the Decree 26/2005/NĐ-CP, children under age 6 receive free health insurance cards and the state-run health facilities are directly reimbursed by the Children Fund for the services used.



The figure 5 and 6 compare the same profile of health expenditure per insured between men and women and the poor and the non-poor. The group of the poor is the group that corresponds to the category "JL" in the database of the insured.

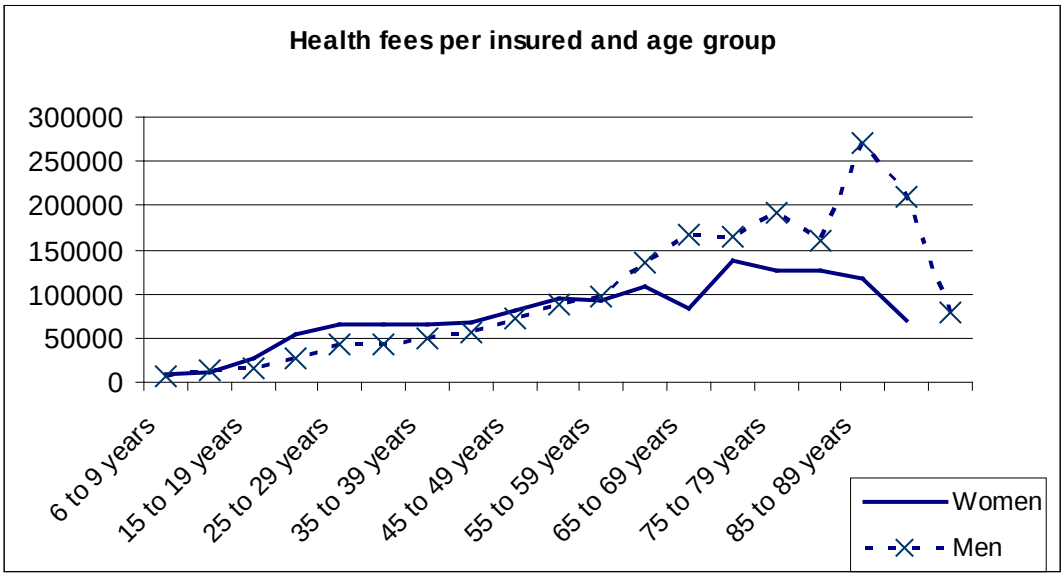
1.1. By gender

Figure 5 compares men and women health expenditure profiles by age group. As expected between the age of 20 and 40 years old, women have on average higher health expenditures per insured than men because of maternity. After the age of 60 years, the men appear to systematically require higher health care. Descriptive studies of the use of health care services by gender typically document higher per capita use by women during the adult reproductive period, followed by a crossover in later years, with higher per capita use among elderly men. Because a substantial fraction of lifetime use of health care services is consumed in the last years of life, age-specific mortality rates (higher among men at relatively younger ages that for women) also contribute to sex differences in the use of health care services.[8] That the gap between men and women remains, however, large at the highest ages suggests that men are more heavy users of health care services than women in KonTum.

In order to avoid to attribute differences in health care use between the poor and the non-poor that are related to gender differences, the comparison of the profile of health fees per insured between the poor and the non poor is done by gender.

[8] Sex Differences in the Use of Health Care Services Cameron A. Mustard, Sc.D., Patricia Kaufert, Anita Kozyrskyj, M.Sc., and Teresa Mayer, 1998 http://content.nejm.org/cgi/content/full/338/23/1678.

Figure 5: Average health expenditures per insured by age group and gender



1.2. "The poor" vs. "the non poor"

As described by the figures published by VSS at the national level, on average in Kon Tum the health expenditures per insured among the non poor is much higher than the average expenditures per insured among the poor both for women and men.

Figure 6a: Average health expenditures per insured by age group and poverty status of women

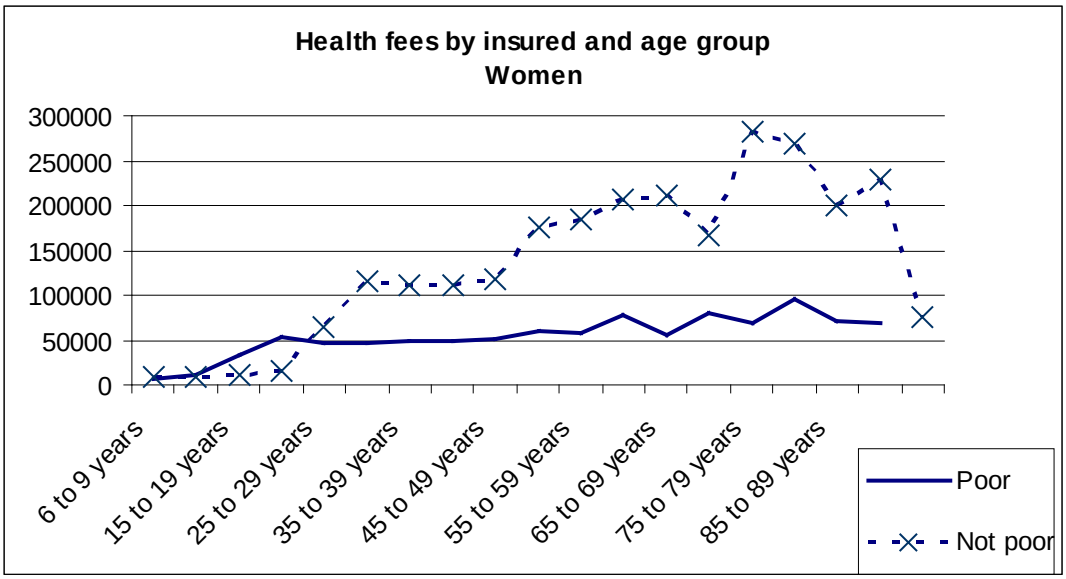
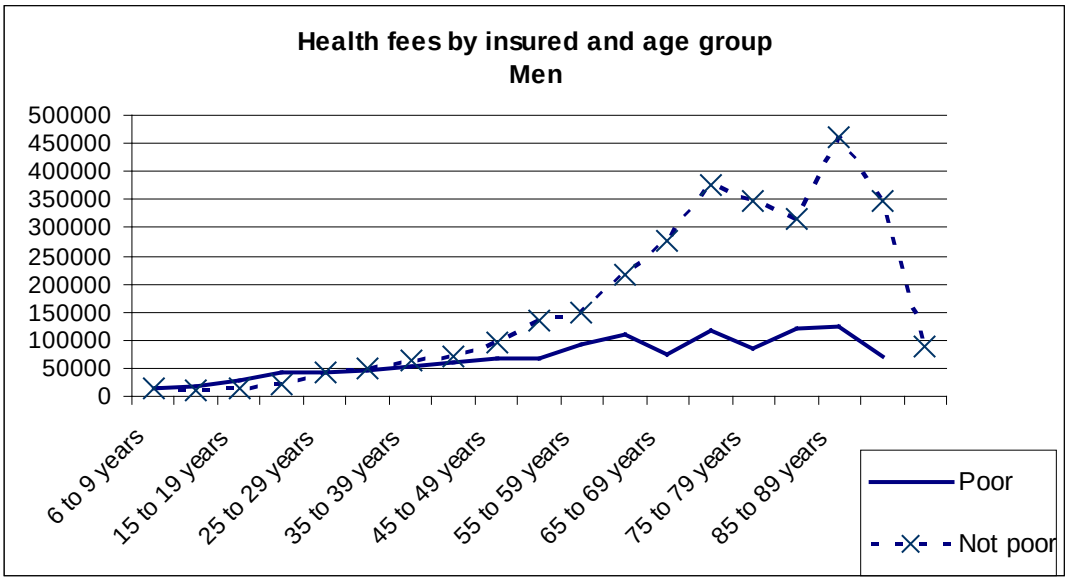


Figure 6b: Average health expenditures per insured by age group and poverty status of men



1.3. Decomposition of health expenditures

Lower amount of health expenditures per insured is due to lower number of visits or to lower use of services per visit (out-patient or in-patient visits), as the equation (1) describes:

$$(1)\quad \frac{Fees}{N} = \frac{Fees}{V} * \frac{V}{N} = \frac{OutF}{OutV} * \frac{OutV}{N} + \frac{InF}{InV} * \frac{InV}{N}$$

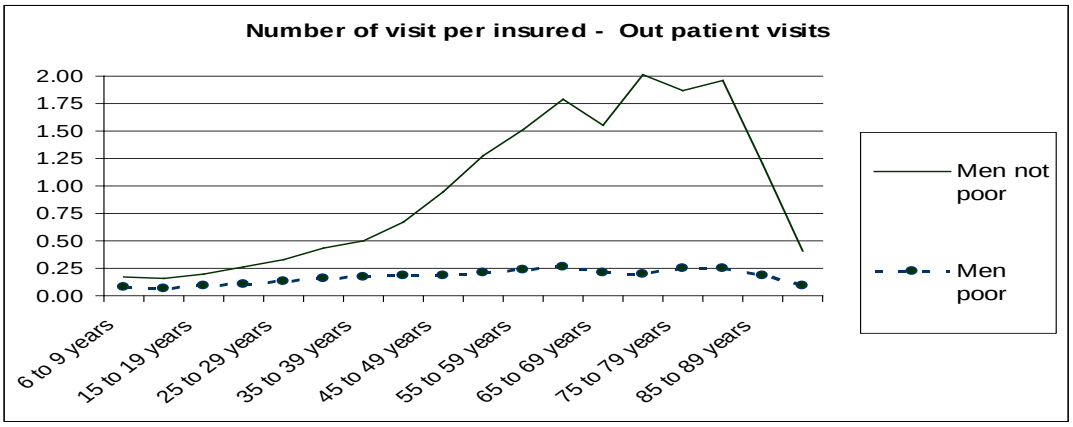
where Fees are total health expenditures fees, N the number of insured and V the number of visits; OutF and OutV, InF and InV are the total health expenditures fees and the number of visits for out-patient and in-patient care.

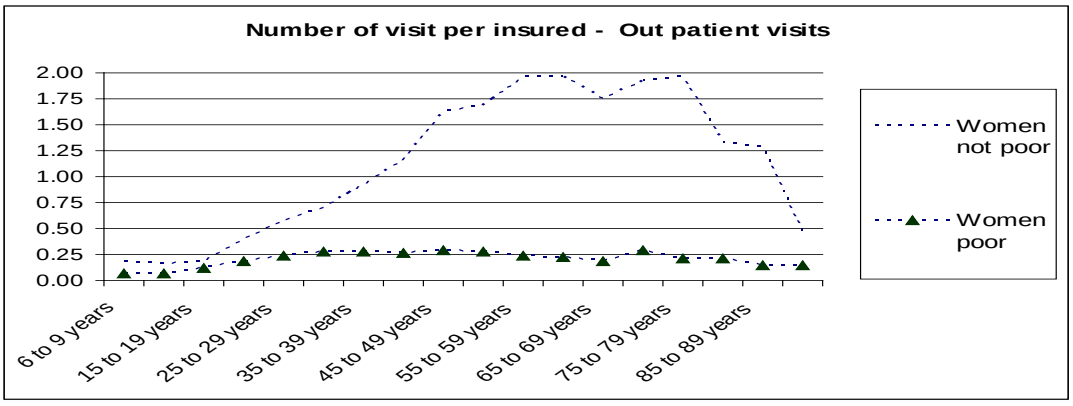
The figures 7a to 7h compare these specific levels between the poor and the non poor by gender. These results are again in line with VSS aggregate figures that show that non poor realize more visits per insured than poor. Interestingly, the gap varies by age group. The elderly poor, particularly, seek health care services much less than the non poor of the same age. There are no strong differences regarding the children. The youth and middle age people realize less out-patient visits but have a profile in patient visit similar to the non poor.

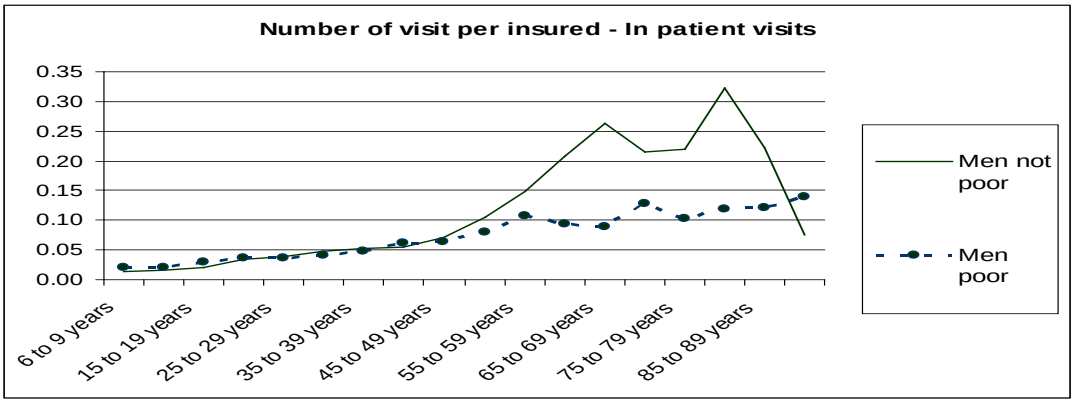
Regarding the amount of fees per visit, the gaps between the poor and the non poor are much smaller and in the case of the in-patient's fees there are not systematically biased in favor of the non poor. These first results suggest that differences in treatment between the poor and the non poor are not obvious. They do not mean, however, that there are no differences in the quality of care. It is often argued that the poor search care only when they are "in need of important care". In that case, if the poor and the non poor are treated for the same diseases, the equivalence of the level of fees per patient between both groups could mean that the poor receive "lower cost" treatments. If the poor and the non poor do not seek care for the same diseases, the equivalence could mean that non poor receive particularly "high cost" treatment since the poor for being particular sick has also receive high cost treatment. The study, accordingly, continued the analysis by comparing the level of fees per visit of similar people suffering from similar diseases. This is feasible because the recording system of the visit includes codes for about one thousand health conditions (ICD10 International Classification of Diseases 10th version of the World Health Organization). This information was not reported in all the cases, however (see Table 6).

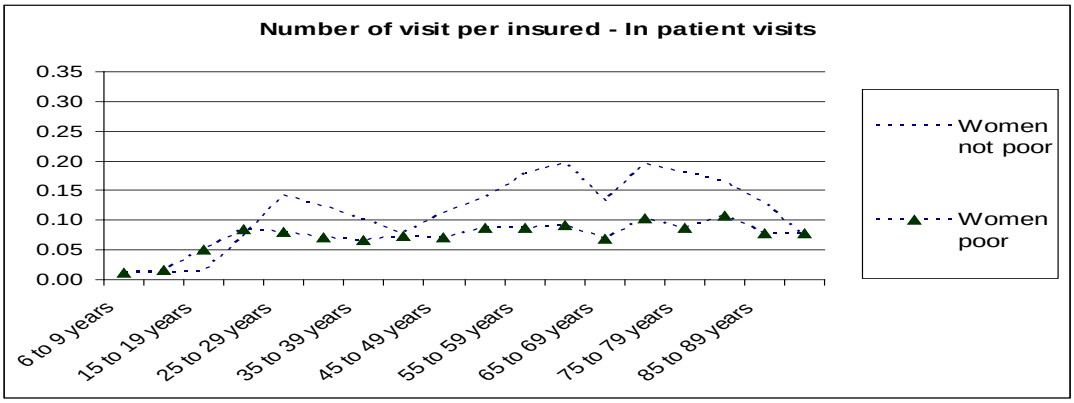
Table 6
Number of records of visits with indication of Disease

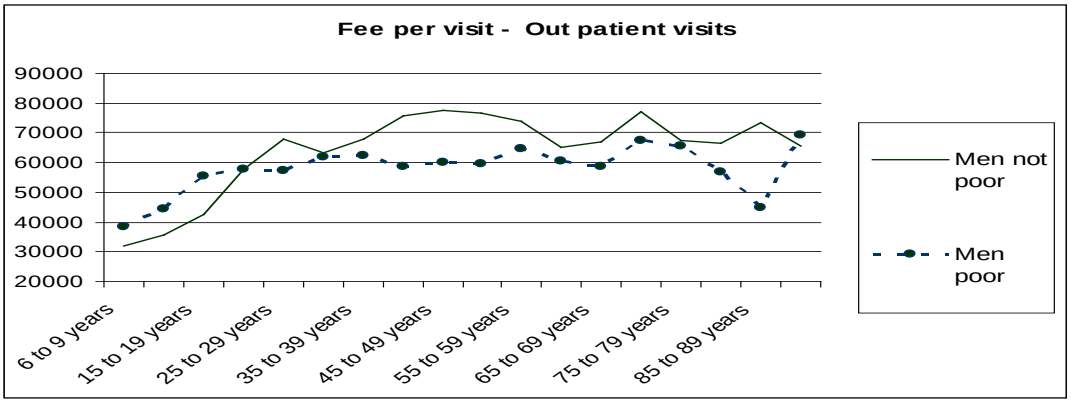
	Out patient		In patient	
Health care unit	No indication	Reported disease	No indication	Reported disease
KonTum	38992	909	15	8717
DakGlei		12603	1	1041
NgocHoi	15422	493	3478	28
DakTo		7133		2345
KonPlong	1852	2048	161	374
DakHa		4320		1149
KonRay		2189		753
Center for officials	4283	40		

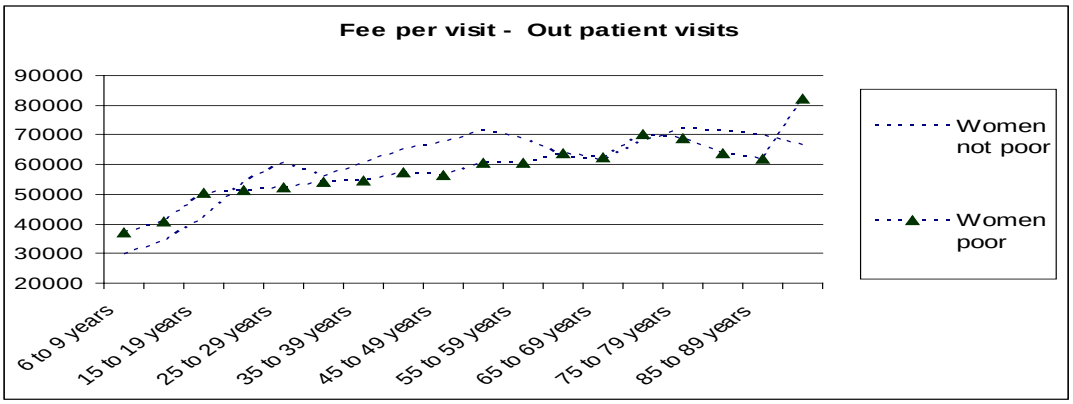

Number of visit per insured - Out patient visits
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Men not poor
Men poor

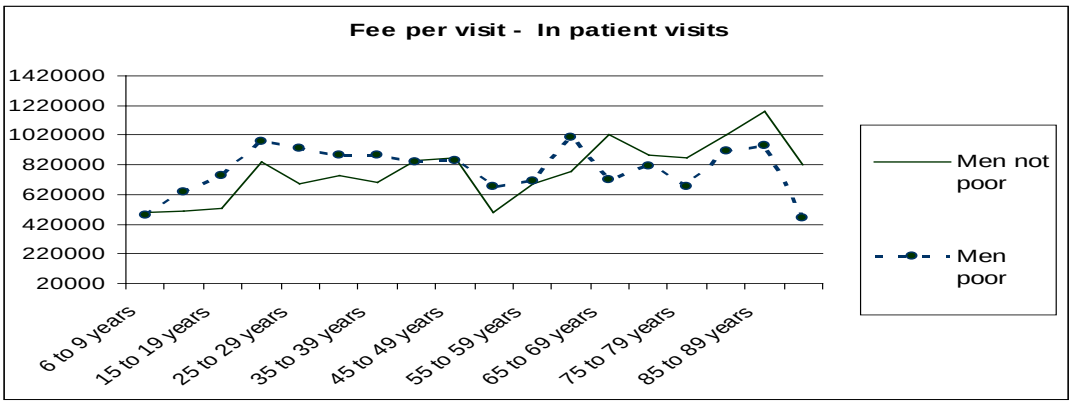

Number of visit per insured - Out patient visits
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Women not poor
Women poor

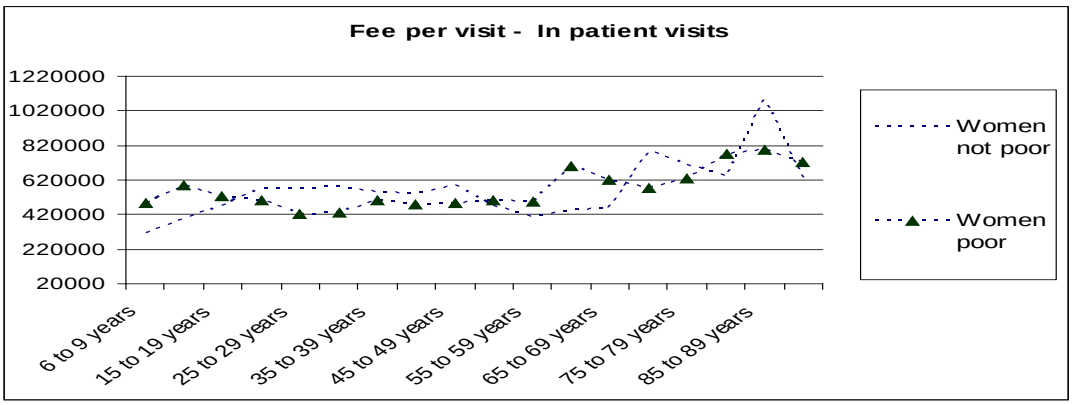

Number of visit per insured - In patient visits
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Men not poor
Men poor


Number of visit per insured - In patient visits
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Women not poor
Women poor


Fee per visit - Out patient visits
90000
80000
70000
60000
50000
40000
30000
20000
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Men not poor
Men poor


Fee per visit - Out patient visits
90000
80000
70000
60000
50000
40000
30000
20000
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Women not poor
Women poor


Fee per visit - In patient visits
1420000
1220000
1020000
820000
620000
420000
220000
20000
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Men not poor
Men poor


Fee per visit - In patient visits
1220000
1020000
820000
620000
420000
220000
20000
6 to 9 years
15 to 19 years
25 to 29 years
35 to 39 years
45 to 49 years
55 to 59 years
65 to 69 years
75 to 79 years
85 to 89 years
Women not poor
Women poor

3. Average health fees per visit per disease age group and gender

Because health conditions and treatment significantly vary with the age and the gender, the analysis searched to compare the level of fees per visit per patient by type of disease, age group and gender. Because of the large number of disease, an econometric approach was used.

Besides comparing between the poor and the non-poor, the econometric approach took advantage of the information include in the address reported in the database of the insurance cards to classify the subsidized "poor" into three categories. As it was explained, above, the group of the subsidized population could be divided into three groups: the beneficiaries of social aid, the members of ethnic minorities and the workers of the informal sector and their families. Table 7 gives the distribution of these populations by district.

Table 7
Distribution of the insured by poverty status

Districts	Non poor	Recipients of social aid	Ethnic minorities	Informal sector	Total
KonTum	53239	730	24752	19076	97797
DakGlei	3154	416	16449	14698	34717
NgocHoi	4020	257	15122	15198	34597
DakTo	3192	129	12567	14188	30076
SaThay	5444	588	13525	12138	31695
KonPlong	2358	34	3539	13656	19587
DakHa	7596	1024	15504	16144	40268
KonRay	3077	3321	6806	5848	19052
TuMoRong	1843	159	6609	13588	22199
Total	83923	6658	114873	124534	329988
Distribution by district					
KonTum	54.4	0.8	25.3	19.5	100.0
DakGlei	9.1	1.2	47.4	42.3	100.0
NgocHoi	11.6	0.7	43.7	43.9	100.0
DakTo	10.6	0.4	41.8	47.2	100.0
SaThay	17.2	1.9	42.7	38.3	100.0
KonPlong	12.0	0.2	18.1	69.7	100.0
DakHa	18.9	2.5	38.5	40.1	100.0
KonRay	16.2	17.4	35.7	30.7	100.0
TuMoRong	8.3	0.7	29.8	61.2	100.0
Total	25.4	2.0	34.8	37.7	100.0

3.1 Fees per patient: total and total per visit per disease

Table 8a and 8b presents the results of a panel regression in which the data was grouped by gender, by age group and by disease (3 digits level). Because some patient realized more than one visit in the year, two dependent variables were tested: the average level of fees per visit by type of disease (Table 6a) or the total fees per patient (sum of all visits for a same disease, Table 6b). In each case, if one patient made two or more visits in relation to two or more different diseases, the fees were treated separately by disease.

Patients referred to the hospital of Kon Tum are supposed to require higher care, so a variable measures the share of visits made to the provincial hospital of Kon Tum in the number of visits realized for each disease (if the patient is not registered in the city of Kon Tum). Another variable also takes into account if the insured is registered at another health unit than the hospital or health centers of his/her district of residence. Almost of these persons are not poor (99.7%).

Table 9 reports the estimated coefficient by poverty status and their combination with the coefficients estimated by district of residence and poverty status. The coefficients are no significant in the case of the poor who are recipients of social benefits.

If all the insured had similar seeking health care behavior and received similar health care services through health insurance (given same health conditions), the coefficients by age and gender and group of disease should be randomly around similar averages whatever the poverty status or other characteristics of the patient.

The results show clearly that it is not the case. For a same disease and within the same age and the same gender group the level of health expenditures per patient of the ethnic minorities and of the informal sector are, on average, significantly lower than for the non poor.

Several interpretations of the coefficients are possible.

The analysis by age and gender searches to compare patients with similar needs. If such correction had not been successful but still all the patients received care according to their health conditions, the highest coefficient should be associated to the populations with the worse health conditions. Negative coefficients should be associated to the populations with better health status. It is not likely the case here. It usually said that subsidized populations seek health care only when they are seriously ill, so such result would be very surprising.

It could be, however, possible when comparing two groups of non poor if the seriously sick members of on of these groups do not use health insurance: for example, in order to rapidly access the services of the provincial hospital without having to obtain a referral.

If the proxy is effectively successful in allowing the comparison of people with the same health conditions, negative coefficients reflect equity problems in the provision of health care services. Because many of the lists of fees have not been revised since 2005, health insurance probably covers only a portion of the cost of the health services. Only the people who can pay for these extra costs receive the "appropriate treatment".

The gap between the coefficients associated to the poor and the non poor can be even larger if providers take advantage of the superiority of their knowledge to excessively prescribe exams and treatments to the non poor.

In summary:

Interpreting the coefficients	
Non poor	**Other groups of non poor and subsidized groups**
Average need	**+** worse health condition (subsidized groups)
Average need	**-** better health conditions, when seriously sick they do not use HI, but go directly to Kon Tum (other non poor groups)
Average need	**-** better health conditions, when seriously sick they do not use HI, because of the fear of not being able to cover the costs not reimbursed by HI, or because of cultural preferences for the use of traditional medicine
Appropriate treatment	**-** receive only the types of care for which they can pay the extra costs (subsidized groups)
Appropriate treatment	**+** providers take advantage to provide extra care that are not necessarily needed (other non poor)

The negative coefficients associated to the members of the ethnic minorities and the poor from the other group suggest, therefore, that these populations either do not come to the hospital when they are seriously sick or when they come they receive less costly treatment. Estimations in section 3.3 and 4 on health care expenditures by items and on health care seeking behavior look in more details at these two issues.

Table 8a: Random-effects GLS regression

Group variable: by disease, by age group, by gender

R-sq: within = 0.1812 Number of obs 31564
between = 0.4400 Number of groups 3384
overall = 0.4061 Obs per group: min = 1 avg = 19.3 max 762

Dependent variable: log average fee per visit per patient

Disease 3 digit	coeff	Sgn[1/]	Interv. of conf.	
categorical poor	-0.41		-1.01	0.20
ethnic minorities poor	-0.50	***	-0.62	-0.38
other poor	-0.61	***	-0.74	-0.48
not register in distrist of residence	-0.52	***	-0.58	-0.46
% of visit for in hospital of KonTum	1.06	***	1.01	1.11
if poor categorical	0.23	**	0.07	0.39
if poor ethnic minorities	0.39	***	0.31	0.46
if other poor	0.39	***	0.31	0.46
district of KonTum categorical P	0.32		-0.31	0.96
ethnic min.	-0.49	***	-0.62	-0.35
other poor	-0.32	***	-0.45	-0.19
district of Dak Glei non poor	-0.60	***	-0.67	-0.53
categorical P	-0.28		-0.90	0.33
ethnic min.	-0.17	**	-0.30	-0.05
other poor	-0.03		-0.16	0.11
district of Ngoc Hoi non poor	-0.63	***	-0.76	-0.50
categorical P	-0.18		-0.90	0.55
ethnic min.	-0.36	***	-0.50	-0.22
other poor	-0.21	**	-0.35	-0.06
district of Dak To non poor	-0.91	***	-0.96	-0.87
categorical P	-0.61	*	-1.22	0.00
ethnic min.	-0.44	***	-0.56	-0.32
other poor	-0.21	***	-0.34	-0.08
district of SaThay non poor	-0.44	***	-0.59	-0.29
categorical P	0.15		-0.55	0.84
ethnic min.	-0.20	**	-0.36	-0.03
district of Kon Plong non poor	-0.66	***	-0.74	-0.59
categorical P	0.16		-0.70	1.03
ethnic min.	-0.23	***	-0.38	-0.08
other poor	0.00		-0.14	0.14
district of Dak Ha non poor	-0.79	***	-0.84	-0.74
categorical P	-0.47		-1.08	0.14
ethnic min.	-0.34	***	-0.47	-0.22
other poor	-0.15	**	-0.28	-0.02
district of Kon Ray non poor	-0.94	***	-1.00	-0.88
categorical P	-0.52	*	-1.13	0.10
ethnic min.	-0.42	***	-0.56	-0.28
other poor	-0.34	***	-0.47	-0.20
district of Tu Mo Rong non poor	-0.44	***	-0.58	-0.29
other poor	0.01		-0.13	0.16
Constant	12.27	***	12.23	12.32

Note: 1/ *** significant less than 1%, ** less than 5 % * 10% or less

Table 8b: Random-effects GLS regression

Group variable: by disease, by age group, by gender

R-sq: within = 0.1812 Number of obs 31564
between = 0.4400 Number of groups 3384
overall = 0.4061 Obs per group: min = 1 avg = 19.3 max 762

Dependent variable: log average fee per visit per patient

Disease 3 digit	coeff	Sgn[1/]	Interv. of conf.	
categorical poor	-0.36		-0.99	0.28
ethnic minorities poor	-0.67	***	-0.81	-0.54
other poor	-0.57	***	-0.71	-0.43
not register in distrist of residence	-0.51	***	-0.58	-0.45
% of visit for in hospital of KonTum	1.02	***	0.96	1.08
if poor categorical	0.24	**	0.07	0.41
if poor ethnic minorities	0.39	***	0.31	0.47
if other poor	0.40	***	0.32	0.48
district of KonTum categorical P	0.29		-0.38	0.96
ethnic min.	-0.29	***	-0.41	-0.16
other poor	-0.34	***	-0.47	-0.20
district of Dak Glei non poor	-0.30	***	-0.37	-0.23
categorical P	-0.07		-0.72	0.57
ethnic min.	0.12		-0.02	0.25
other poor	0.04		-0.10	0.18
district of Ngoc Hoi non poor	-0.56	***	-0.69	-0.42
categorical P	-0.23		-1.00	0.54
ethnic min.	-0.07		-0.21	0.07
other poor	-0.14	*	-0.30	0.01
district of Dak To non poor	-0.84	***	-0.89	-0.79
categorical P	-0.58	*	-1.22	0.07
ethnic min.	-0.26	***	-0.39	-0.13
other poor	-0.25	***	-0.39	-0.11
district of SaThay non poor	-0.40	***	-0.55	-0.24
categorical P	0.15		-0.59	0.88
district of Kon Plong non poor	-0.58	***	-0.66	-0.50
categorical P	0.26		-0.64	1.17
ethnic min.	-0.04		-0.20	0.13
other poor	-0.01		-0.16	0.14
district of Dak Ha non poor	-0.79	***	-0.84	-0.74
categorical P	-0.53		-1.17	0.11
ethnic min.	-0.17	**	-0.30	-0.04
other poor	-0.21	***	-0.35	-0.07
district of Kon Ray non poor	-0.93	***	-1.00	-0.87
categorical P	-0.58	*	-1.22	0.06
ethnic min.	-0.25	***	-0.40	-0.11
other poor	-0.39	***	-0.53	-0.25
district of Tu Mo Rong non poor	-0.42	***	-0.57	-0.27
ethnic min.	0.16	*	-0.01	0.34
other poor	-0.05		-0.20	0.11
Constant	12.33	***	12.28	12.37

Note: 1/ *** significant less than 1%, ** less than 5 % * 10% or less

The negative coefficients associated to the persons who are registered at another health unit than the hospital or health centers of his/her district of residence suggest two types of explanations. On the one hand, these persons are more likely more mobile than the rest of the population. It could be, therefore than they are more inclined to use the health care facilities of Kon Tum even if they are not reimbursed. On the other hand, since 39% of these persons are registered in the city of Kon Tum, it could be that they are less wealthy than the persons of the group of the non poor in general and thus like the poor cannot afford the cost related to the 'full treatment".

The results reported in Table 8 indicate that, when looking at the coefficient by place of residences, other differences can be observed among the group of the non poor. First all the non poor who live in other district than the district of Kon Tum use also on average less costly treatment than the non poor that live in the district of Kon Tum. Because Kon Tum is probably the wealthier district of the province, this result could reflect some economic differences between the population of the other district in general and Kon Tum. Second, in the case of the district of Dak To, Kon Ray and Dak Ha that are the closest from Kon Tum, the coefficients are particularly negative and low. This suggest that these non poor populations effectively prefer go directly to the provincial hospital of Kon Tum even if, without referral, they don't have part of their fees reimbursed by health insurance.

If the explanation that the non poor do not use health insurance and prefer directly go to the health care centers of Kon Tum instead of using the health care units of their district is true, the relative size of the cost per visit or per patient from other groups of the same district should on average be higher. It is effectively the case in the case of the poor, who are recipients of social benefits, in the district of Dak To and Kon Ray, and in the case of the poor from the informal sector in the district of Dak To and Dak Ha[9]. In the three districts, the coefficients associated to the members of ethnic minorities are, however, about as low (Kon Ray) or even lower (in Dak To and Dak Ha). Unless the members of the ethnic minorities in these districts share the same socio economic profile than the non poor, these results suggest that at the opposite the members of these groups receive, in particular, lower health care services than the other groups.

[9] The gap between the corresponding coefficients and the coefficient of the non poor in the same district ranges from 0.01 to 0.09.

Table 9 **Coefficient associated by poverty status and residences**				
		Cost per visit	Total cost	
Estimated coefficients associated to poverty status [1]				
a. Poor per categories		Not significantly different from 0		
b. Ethnic minority		**-0.50**	**-0.67**	
c. Other subsidized populations		**-0.61**	**-0.57**	
Not register in district of residence		**-0.52**	**-0.51**	
Combining coefficient estimated by poverty status and residence and poverty status [1]				
District of residence [2]	**Non poor**	**Poor per Categories**	**Ethnic minorities**	**Other subsidized populations**
Expenditure per visit by group of disease, age and gender				
d. Kon Tum	***0.00***		-0.98	-0.94
e. Dak Glei	-0.60		-0.67	-0.61
f. Ngoc Hoi	-0.63		-0.86	-0.82
g. Dak To	-0.91	-0.61	-0.94	-0.82
h. Kon Plong	-0.66		-0.73	-0.61
i. Dak Ha	-0.79		-0.84	-0.76
j. Kon Ray	-0.94	-0.52	-0.92	-0.95
Expenditure per patient (all visits confounded) by group of disease, age and gender				
d. Kon Tum	***0.00 ******		-0.96	-0.91
e. Dak Glei	-0.30		-0.56	-0.57
f. Ngoc Hoi	-0.56		-0.67	-0.71
g. Dak To	-0.84	-0.58	-0.93	-0.82
h. Kon Plong	-0.58		-0.67	-0.57
i. Dak Ha	-0.79		-0.84	-0.78
j. Kon Ray	-0.93	-0.58	-0.93	-0.96

Note: 1/the estimation attributes a coefficient equal to 0 to the group of the non poor and, also to the residents of the city of Kon Tum. The other coefficients indicate if the persons of the other group or the persons that live in another place have receive on average more or less costly treatment. Consequently the coefficient reported in the line d to j are the sum of the corresponding coefficients a,b, or c and the coefficients associated to the same groups at the level of the district. When the "t-test" could not conclude that the coefficient is different from zero, zero was added 2/ the coefficients of the districts of Sa Thay and Tu Mo Rong are not reported because the patients' files does not include the visits made at these district hospitals .

The results for the other 3 districts suggest always that the ethnic minorities as well as the poor of the informal sector receive health care services less costly. Sometimes the level of the coefficient is the lowest for the members of the ethnic minorities like in Kon Plong, sometimes it is the opposite like in Ngoc Hoi and sometimes the coefficients associated to the members of the other group of poor and the member of the ethnic minorities are about the same like in Dak Glei.

Finally, the coefficients associated to the members of ethnic minorities and the poor from the informal sector in the city of Kon Tum are particularly low. This could be due to the fact that the health care services provided at the provincial hospital of Kon Tum are the most expensive with probably the highest costs not

reimbursed by health insurance. Low income populations have particularly hard time access to these services. The low levels of the coefficient suggest that these populations could even have access to lower services than the same population of other districts.

Regarding the coefficients associated to referrals: higher the share of referrals in the total number of visits is, higher the total cost of the visit or of the total treatment for the disease is. All the coefficients are positives whatever the poverty status. The average fees per visit of the patients referred to the hospital of Kon Tum are higher. However, when these coefficients are combined with the coefficients associated to the poverty status, the highest impact of the larger share of the referrals in the visits is observed in the case of the non poor. The members of ethnic minorities and of the informal sector receive on average relatively less expensive health care services when their disease requires referrals to the hospital of Kon Tum.

Table 10
Coefficient associated by poverty status to the referrals to the provincial hospital of Kon Tum

	Cost per visit	Total cost
Estimated coefficients		
a.Recipients of social aid	-0.41	-0.36
b.Ethnic minority	**-0.50**	**-0.67**
c.Informal sector	**-0.61**	**-0.57**
d.Not registered in district of residence	**-0.52**	**-0.51**
% of visit in hospital of KonTum		
e. non poor	**1.06**	**1.02**
f. recipients of social aid	**0.23**	**0.24**
g. ethnic minorities	**0.39**	**0.39**
h. informal sector	**0.39**	**0.40**
Combined coefficient depending on poverty status		
Non poor (0 + e)	**1.06**	**1.02**
Recipients of social aid (a+ e + f)	Coeff (a) not significatif	
Ethnic minorities (b + e + g)	**0.95**	**0.74**
Informal sector (c + e + h)	**0.84**	**0.85**

3.2 Detailed fees per patient

The lower level of expenditures per visit or patient can be related to the provision of less expensive health care services. The underlying hypothesis is that because health insurance does not reimburse the totality of the cost provided, only the person that pay for the un-covered cost receives relatively more expensive treatments. As it was mentioned early, providers can also push the non-poor to overspend in not “necessary” treatments. The study searched, therefore, to observe if the treatments received by the different groups vary.

Table 11 presents the different items of health expenditures for which the database reports the amount spend in each visit.

Table 11 **Health expenditures by specific costs**	
Cost 1	Consultations (out-patient) or for the number of days of in-patient care (bed)
Cost 2	Drugs
Cost 3	Blood
Cost 4	Laboratory exams
Cost 5	Radiology
Cost 6	Minor surgery
Cost 7	Major surgery
Cost 8	Various consumables
Cost 9	Transportation

A relation similar to the ones presented in Tables 8 was estimated per each of these costs with as dependent variable the total cost per patient. Again, the observations were grouped according to the type of disease, the age and the gender of the patient.

Table 12 like Table 9 presents the coefficients associated to the poverty status of the patients and the larger share of referrals in the number of visits. For references the two first column report the coefficients obtained in the estimation on the total expenditures per patient, and per visit.

These results show, first, that the coefficients associated to the members of the ethnic minorities and the informal sector are significantly negative, except in the case of the drugs and transportation[10], and radiology only in the case of the ethnic minorities. The lowest coefficient are observed in relation to the amount spent on major surgery, blood, consumables, laboratory exams, minor surgery and consultation fees (that vary according to the number of in-patient days). The estimations were performed separately by type of cost. They do not check therefore how they correlate to each other. Because usually, surgery require a series of preliminary and post analysis and care, these results suggest, however, that the main cause of these differences is that poor undergo significantly less surgery (major and minor). As a result, they possibly receive less amount of blood, they pass less laboratory exams and they use less consumable. The coefficient associated to the poor that receive social benefits is significant only in the case of the laboratory exams (and it is particularly low).

[10].A lump sum depending on the distance from the residence to the hospital is allocated for medical transport costs during referrals. In recent years in Kon Tum, some poor people have also received subsidies for meals, lodging and medical transport during inpatient treatment through donor projects.

These results well fit with the idea that the provision of certain care are not provided because of the existence of un-covered costs. The provision of drugs, transportation and radiology services are items that are much less attached to any additional cost, and thus are equally affordable for all the groups.

Regarding the other coefficients, first, the coefficients of the non poor registered at other health facilities than the one of their place of residence are always significant and negative, except in the case of the drugs for which it is significant and positive. These results continue to fit well with the hypothesis that these persons go directly to the provincial hospital of Kon Tum when they are in need of important health care services[11]. They are more inclined to use health insurance benefits to reduce the cost to obtain drugs and in to a certain extent laboratory analysis (the coefficient is relatively closer to zero).

Second, the coefficients associated to higher share of referrals in the number of the visits of each patient are always significant and positive. The highest levels are associated to the non poor in the case of major surgery, blood, consumable and laboratory exams. They are the highest in the case of the poor in the case of minor surgery, the consultancy fees (that is the number of in-patient days) and radiology. Again, there are no large differences in the case of drugs.

It is often said that the poor seek health care only when they are seriously sick. This is maybe true, but on average they appear to undergo less major surgery than the non poor even if they are referred to the provincial hospital. These figures suggest important equity problems even if both populations reach the health care units with on average the same health condition. If it is true, that selection bias lead that the poor that reach the hospitals are on average with worse health condition, the equity problem is even larger[12]. These results suggest that instead of undergoing major surgery, as they probably need, many poor undergo minor surgery.

The results suggest also some equity issues among the poor. In the case of major surgery, the gap between the coefficients associated to referrals to the hospital of Kon Tum between the non poor and the poor that receive social benefits is of 1.59, it is of 1.71 with the poor of the informal sector and and of 1.74 with the members of ethnic minorities. The gaps in the case of blood costs are of 0.26 between the non poor and the poor that receive social benefits, of 0.68

[11] Many coefficients associated to the different groups by districts are not significant. It is interesting to observe however that the coefficients associated to average cost of major surgery per patient of the non poor of the district of Dak To, Dak Ha and Kon Ray that are close to the city of Kon Tum are siginificant and particularly low. This remark corroborates the hypothesis that part of these population do not use health insurance and prefer to go directly to the provincial hospital.

[12] In that case, if there were no equity problems, the coefficients associated to the poor should not be of about the same as for the non poor, but they should be significant and positive

with the poor of the informal sector and of 0.95 with the members of ethnic minorities.

Table 12
Coefficient associated by poverty status to the referrals to the provincial hospital of Kon Tum by cost

Estimates by patient, disease, age group and gender	Cost per visit	Total cost	Visit or bed	Drugs	Blood
a.Categorical	-0.41	-0.36	-0.04	0.17	0.35
b.Ethnic minority	**-0.50**	**-0.67**	**-0.31**	0.00	**-0.90**
c.Other poor	**-0.61**	**-0.57**	**-0.26**	-0.02	**-1.30**
d.Not registered in district of residence	**-0.52**	**-0.51**	-0.03	**0.18**	**-0.76**
% of visit at KonTum's hospital e. if non poor	**1.06**	**1.02**	**0.25**	**0.20**	**1.66**
f. if poor categorical	**0.23**	**0.24**	**0.21**	0.15	**1.40**
g. if poor ethnic minorities	**0.39**	**0.39**	**0.42**	**0.21**	**0.71**
h. if other poor	**0.39**	**0.40**	**0.51**	**0.23**	**0.98**
Combined parameters, parameters associated with referrals to the hospital of Kon Tum *(the sum includes only coefficients significantly different from zero)*					
Non poor (0 + e)	**1.06**	**1.02**	**0.25**	**0.20**	**1.66**
Categorical (a+ e + f)					
Ethnic minorities (b + e + g)	**0.95**	**0.74**	**0.36**		**1.48**
Other poor (c + e + h)	**0.84**	**0.85**	**0.49**		**1.34**

Table 12 continue

	Laboratory exams	Radio -logie	Minor surgery	Major surgery	Cons. goods	Transport
a.Recipients of social aid	**-0.96**	-0.05	-1.09	0.38	-0.27	-0.42
b.Ethnic minority	**-0.72**	0.00	**-0.53**	**-2.30**	**-0.96**	-0.13
c.Informal sector	**-0.76**	**-0.19**	**-0.79**	**-2.45**	**-0.85**	0.19
d.Not registered in district of residence	**-0.15**	0.01	0.12	**-2.56**	**-0.76**	**-1.52**
% of visit Kon Tum hosp. e. non poor	**0.68**	**0.14**	**0.17**	**3.02**	**1.33**	**1.25**
f. recipients social aid	**0.24**	0.12	**0.48**	**1.43**	**0.61**	0.45
g. ethnic minorities	**0.40**	**0.26**	**0.71**	**1.28**	**0.57**	**-0.51**
h. informal sector	**0.43**	**0.28**	**0.81**	**1.31**	**0.69**	-0.45
Combined parameters, parameters associated with referrals to the hospital of Kon Tum *(the sum includes only coefficients significantly different from zero)*						
Non poor (0 + e)	**0.68**	**0.14**	**0.17**	**3.02**	**1.33**	**1.25**
Recipients of social aid (a+ e + f)	**-0.04**					
Ethnic minorities (b+e+g)	**0.36**	**0.40**	**0.35**	**2.01**	**0.94**	**0.61**
Informal sector(c + e + h)	**0.35**	**0.24**	**0.20**	**1.88**	**1.17**	

4. Health care seeking behavior

The aggregate figures presented in the second section indicate large differences between the number of visits per insured among the poor and the non-poor particularly at higher ages. The study tried to investigate these differences in health care seeking behavior. The best comparison would be to compare the health care seeking behavior of persons affected with the same disease. This was, however, impossible to perform because we do not know which insured with similar diseases have decided not to visit a health care unit.

4.1 Average number of visits per gender, age, commune of residence and poverty status

The study opted to an econometric approach that intends to reduce this problem. Because it is impossible to compare individuals, the approach searched to explain the variations of the number of visits per specific groups. The groups are first defined according to the age and gender of the insured. Then individuals are grouped again according to their commune of residence and their poverty status. The assumption is that if only health status has an impact on individuals' health seeking behavior the number of visits per group should not be varying according to the criteria of residence and poverty status. Because health deteriorates with age it is, moreover, expected that the coefficients associated with the age group are increasing. Table 13 presents the results. Because the analysis relies on insured average behaviors, the sample was restricted to observations that represent the number of visits per insured of groups that include at least 100 individuals. The groups of insured of the district of Sa Thay and Tu Mo Rong have been also excluded from the regression since the database on patients does not include the visits made by these populations to their respective district hospitals.

Table 13: Ordinary Least Squared Regression				
Dependent variable: number of visit per insured calculated by groups of insured grouped by gender age group and poverty status				
Number of observations: 765				
R squared: 0.7373				
Adj. R squared: 0.7181				
Sample includes only groups with at least 100 insured per group (over 62 communes)				
	Coefficient	1/	Confidence Interval	
Reside in Dak Glei	0.01		-0.17	0.19
Ngoc Hoi	-0.09		-0.24	0.07
Dak To	**-0.20**	***	-0.32	-0.08
Kon Plong	-0.07		-0.26	0.11
Dak Ha	**-0.16**	***	-0.24	-0.08
Kon Ray	**-0.12**	**	-0.21	-0.03
Men 6 to 14 yrs And social aid	**0.61**	*	-0.03	1.25
Ethnic minor.	0.11		-0.08	0.31

	Informal s.	0.11		-0.07	0.30
Men 15 to 24 yrs	Non poor	**0.29**	**	0.06	0.53
	And social aid	**0.51**	**	0.07	0.95
	Ethnic minor.	0.14		-0.05	0.34
	Informal s.	**0.16**	*	-0.02	0.35
Men 25 to 39 yrs	Non poor	**0.36**	***	0.16	0.56
	And social aid	**0.67**	**	0.02	1.31
	Ethnic minor.	**0.20**	**	0.00	0.39
	Informal s.	**0.22**	**	0.04	0.40
Men 40 to 64 yrs	Non poor	**1.11**	***	0.90	1.31
	And social aid	**0.71**	***	0.29	1.14
	Ethnic minor.	**0.33**	***	0.13	0.53
	Informal s.	**0.31**	***	0.12	0.49
Men 65 and up	Non poor	**2.41**	***	2.13	2.69
	And social aid				
	Ethnic minor.	**0.38**	*	-0.01	0.76
	Informal s.	**0.43**	**	0.06	0.81
Women 6-14 yrs	Non poor	0.01		-0.20	0.21
	And social aid	**0.62**	*	-0.02	1.27
	Ethnic minor.	0.07		-0.12	0.26
	Informal s.	0.10		-0.08	0.29
Women 15-24 yr	Non poor	**0.40**	***	0.17	0.64
	And social aid	**0.62**	***	0.18	1.06
	Ethnic minor.	**0.24**	**	0.04	0.43
	Informal s.	**0.27**	***	0.08	0.45
Women 25-39 yr	Non poor	**0.77**	***	0.58	0.96
	And social aid	**0.73**	**	0.09	1.37
	Ethnic minor.	**0.37**	***	0.18	0.57
	Informal s.	**0.38**	***	0.20	0.56
Women 40-64 yr	Non poor	**1.60**	***	1.39	1.81
	And social aid	**0.96**	***	0.52	1.40
	Ethnic minor.	**0.41**	***	0.21	0.61
	Informal s.	**0.37**	***	0.19	0.56
Women 65 & up	Non poor	**1.57**	***	1.29	1.85
	And social aid				
	Ethnic minor.	**0.29**	**	0.00	0.57
	Informal s.	**0.45**	***	0.16	0.75
Ratio referrals in visit per ins.		-0.23	***	-0.33	-0.14
% And social aid in commune		-0.65	**	-1.18	-0.11
% Ethnic minority in commune		0.05		-0.13	0.22
% Informal s. in commune		-0.03		-0.17	0.11
Total exp. per ins. in commune		0.01	***	0.01	0.01
Distance commune – Kon Tum		-0.09	***	-0.12	-0.06
Km of bad road to Kon Tum		0.09	***	0.06	0.12
Km of very bad road		0.09	***	0.06	0.12
Km of extremely bad road		0.09	***	0.06	0.12
Constant		-0.21	**	-0.38	-0.04

The results show that effectively the number of visit per insured increases with the age of the insured. As age increases and health deteriorates people seek more health care. This is observed among the non poor as well as among the poor and the members of the ethnic minorities. But the levels of the coefficients as well as their profile of increase strongly vary depending on the poverty status. The coefficients are reported in Table 14 and the profiles are illustrated in the figures 8a and 8b.

The data does not allow make comparisons in the case of the children. For the youth, the levels of the coefficients obtained for the informal sector and the members of ethnic minorities are about half the level of the coefficients obtained for the non poor. This gap is even larger at older ages, when the needs of health care increase.

In the particular case of the women, the coefficient associated to the group of the non poor aged group 25 - 39 yrs is almost the double of the coefficient obtained for the non poor aged 15-24 yrs. In the case of the members of ethnic minorities or of the informal sector, the coefficient of the women 25-39 years is only 59% higher than for the women 15-24 years. These results suggest that many women of the ethnic minorities and the informal sector do not search particular health care support during pregnancy and when giving birth.

One important gender difference appears finally in the profile of the coefficients of the non poor. The coefficient of the group age 65 years and up is the highest in the case of the men, but it is not in the case of the women. Although health deteriorates with age, elderly women do not seek particularly more health care even if they live in non poor households.

Table 14
Coefficients associated to poverty status in the estimation of the average number of visits per insured per age and gender

	6-14 yrs	15-24yrs	25-39yrs	40-64yrs	65yrs+
Men					
Non Poor		**0.29**	**0.36**	**1.11**	**2.41**
Poor Categories	**0.61**	**0.51**	**0.67**	**0.71**	
Ethnic Minorities			**0.20**	**0.33**	**0.38**
Other Poor		**0.16**	**0.22**	**0.31**	**0.43**
Women					
Non Poor		**0.40**	**0.77**	**1.60**	**1.57**
Poor Categories	**0.62**	**0.62**	**0.73**	**0.96**	
Ethnic Minorities		**0.24**	**0.37**	**0.41**	**0.29**
Other Poor		**0.27**	**0.38**	**0.37**	**0.45**

Figure 8a

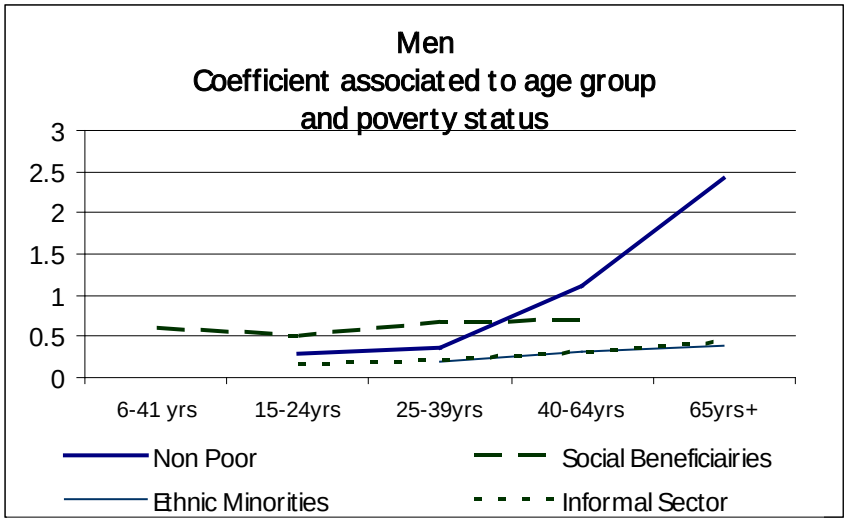
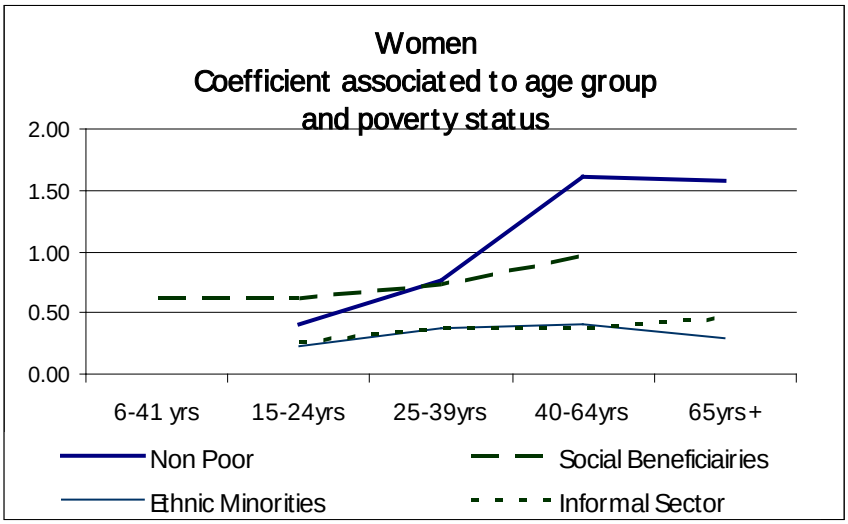


Figure 8b



4.2 Referral to the hospital of Kon Tum

The hypothesis the study, finally, searched to test is: "if the poor are less inclined to seek health care in general and do seek health care only when they are seriously ill, the number of referrals per insured should be higher or at least similar in the case of the poor than in the case of the non-poor" .
If regular visits decrease the probability of getting seriously ill, or the non poor prefer to directly go to the provincial hospital, the number of referrals per insured among the non poor should be (everything else equal) even significantly lower.

It could be however, that because of the very low frequentation of the health care facilities by the poor, still the relative number of serious cases per insured that lead to search health care is lower among the poor than among the non poor. If this is the case, the average number of referrals per insured for the poor is lower for the non poor, but the share of referrals in the number of visits done by the poor should be higher than in the visits done by the non poor.

Two regressions were accordingly done. The first one estimated the probability of being referred to the provincial hospital of Kon Tum. The second estimated the share of referrals in total number of visits realized by the group. Table 15 and Table 16 presents the results. The results in the first regression include, this time, the groups of insured of the district of Sa Thay and Tu Mo Rong are included since their visits to the hospital of Kon Tum are recorded. The insured of the district of Kon Tum are excluded because it is impossible to distinguish which patients were specifically referred to the hospital of Kon Tum. The second regression excludes from the sample the insured registered in Kon Tum and in the districts of Sa Thay and Tu Mo Rong (because the visits done at the district level are not in the database).

Te results are also disturbing. Regarding the number of referrals per insured, the coefficients associated to the members of ethnic minorities and of the informal sector are not significantly different from zero. Most of the few significant coefficients that are positive are associated to groups of the non poor, only two are associated to the poor who are recipients of social aid and in each case the coefficient is lower than for the non poor. The exact remarks apply for the results obtained on the share of the visits that are referrals. In both regression, living in a commune with a higher share of people from ethnic minorities increase the probability of referrals.

The data does not show evidences that the poor are particularly with severe conditions when they visit the hospitals or that districts hospitals judge that their conditions require special care from the provincial hospital.

Table 15 Ordinary Least Squared Regression

Dependent variable: number of referrals to the provincial hospital of Kon Tum per insured calculated by groups of insured grouped by gender age group and poverty status

Number of observations: 777

R squared: 0.734

Adj. R squared: 0.7161

Sample includes groups with at least 100 insured per group (over 62 communes)

	Coefficient	1/	Confidence Interval	
Reside in Dak Glei				
Ngoc Hoi	0.00		-0.00461	0.004054
Dak To	-0.01	*	-0.01118	0.000211
Sa Thay	0.00		-0.00921	0.003064
Kon Plong	-0.01	**	-0.00975	-0.00035

Dak Ha	0.01	***	0.002077	0.015241
Kon Ray	0.00		-0.00762	0.005811
Tu Mo Rong	-0.005	**	-0.00913	-0.00029
Men 6 to 14 yrs And social aid	0.01		-0.02568	0.04186
Ethnic minor.	0.00		-0.01482	0.006362
Other poor	0.00		-0.01199	0.008555
Men 15 to 24 yrs Non poor	0.00		-0.01217	0.013781
And social aid	0.00		-0.01879	0.028038
Ethnic minor.	0.00		-0.01222	0.008981
Other poor	0.00		-0.0095	0.011128
Men 25 to 39 yrs Non poor	0.01	*	-0.00188	0.022483
And social aid	0.01		-0.02068	0.04686
Ethnic minor.	0.00		-0.01213	0.00954
Other poor	0.00		-0.00879	0.011786
Men 40 to 64 yrs Non poor	0.03	***	0.022307	0.046673
And social aid	0.02	*	-0.00068	0.044675
Ethnic minor.	0.00		-0.00912	0.012856
Other poor	0.00		-0.00906	0.011816
Men 65 and up Non poor	0.05	***	0.026932	0.066625
And social aid				
Ethnic minor.				
Other poor	0.01		-0.02133	0.032462
Women 6-14 yrs Non poor	0.00		-0.01627	0.00876
And social aid	0.01		-0.02668	0.04086
Ethnic minor.	-0.01		-0.01681	0.004333
Other poor	0.00		-0.01334	0.007211
Women 15-24 yr Non poor	0.01	*	-0.001	0.02493
And social aid	0.01		-0.01679	0.030038
Ethnic minor.	0.00		-0.00755	0.013623
Other poor	0.00		-0.00813	0.012392
Women 25-39 yr Non poor	0.02	***	0.011727	0.03426
And social aid	0.01		-0.01968	0.04786
Ethnic minor.	0.00		-0.0076	0.01404
Other poor	0.00		-0.0068	0.013744
Women 40-64 yr Non poor	0.06	***	0.047061	0.072976
And social aid	0.02	*	-0.00079	0.046038
Ethnic minor.	0.00		-0.00698	0.014741
Other poor	0.00		-0.0075	0.013247
Women 65 & up Non poor	0.02		-0.00407	0.035625
And social aid				
Ethnic minor.	-0.01		-0.02341	0.01211
Other poor	0.00		-0.01236	0.019134
% And social aid in commune	-0.02		-0.04523	0.010645
% ethnic minority in commune	0.01	**	0.000257	0.017759
% other poor in commune	0.00		-0.00508	0.010089
Distance commune – Kon Tum	0.00		-9.9E-05	0.000034
Km of extremely bad road	-0.0001	**	-0.00022	-1.7E-05
Constant	0.01		-0.00344	0.019906

Table 16 Ordinary Least Squared Regression				
Dependent variable: number of referrals in the total number of visits by groups of insured grouped by gender age group and poverty status				
Number of observations: 624				
R squared: 0.3888				
Adj. R squared: 0.3401				
Sample includes groups with at least 100 insured per group				
	Coefficient	1/	Confidence Interval	
Reside in Dak Glei	-0.20		-1.03037	0.623725
Ngoc Hoi	-0.03		-0.59314	0.533618
Dak To	-0.51	**	-0.96623	-0.04783
Kon Plong	-0.59	*	-1.25703	0.085071
Dak Ha	1.00	***	0.553615	1.442861
Kon Ray				
Men 6 to 14 yrs And social aid	0.98		-2.82987	4.78383
Ethnic minor.	-0.43		-1.78815	0.919331
Other poor	-0.11		-1.42739	1.19969
Men 15 to 24 yrs Non poor	0.23		-1.38122	1.846538
And social aid	0.64		-2.02851	3.312563
Ethnic minor.	-0.09		-1.44556	1.259078
Other poor	0.16		-1.161	1.484552
Men 25 to 39 yrs Non poor	1.15		-0.40689	2.701139
And social aid	1.48		-2.32987	5.28383
Ethnic minor.	-0.02		-1.39092	1.35792
Other poor	0.27		-1.04191	1.586839
Men 40 to 64 yrs Non poor	3.83	***	2.279552	5.387704
And social aid	2.34	*	-0.25285	4.927612
Ethnic minor.	0.29		-1.09639	1.684917
Other poor	0.21		-1.11965	1.544708
Men 65 and up Non poor	4.80	***	2.519785	7.087695
And social aid				
Ethnic minor.				
Other poor	0.71		-2.34808	3.768425
Women 6-14 yrs Non poor	-0.22		-1.82751	1.394722
And social aid	0.88		-2.92987	4.68383
Ethnic minor.	-0.63		-1.97396	0.717213
Other poor	-0.25		-1.56327	1.072631
Women 15-24 yr Non poor	1.38		-0.31137	3.069256
And social aid	0.84		-1.82851	3.512563
Ethnic minor.	0.41		-0.94556	1.759078
Other poor	0.30		-1.01161	1.614622
Women 25-39 yr Non poor	2.43	***	0.987742	3.874253
And social aid	1.58		-2.22987	5.38383
Ethnic minor.	0.48		-0.90164	1.862153
Other poor	0.51		-0.80628	1.817367
Women 40-64 yr Non poor	6.46	***	4.846879	8.069238

And social aid	2.44	*	-0.2285	5.112563
Ethnic minor.	0.55		-0.82733	1.934329
Other poor	0.39		-0.93195	1.72126
Women 65 & up Non poor	1.70		-0.58021	3.987695
And social aid				
Ethnic minor.	-0.56		-2.97578	1.852516
Other poor	0.61		-1.42425	2.638721
% And social aid in commune	-1.77		-4.88354	1.348041
% ethnic minority in commune	1.13	**	0.055413	2.20479
% other poor in commune	0.35		-0.57458	1.281911
Distance commune – Kon Tum	0.00		-0.00728	0.010187
Km of extremely bad road	-0.02	**	-0.02921	-0.00408
Constant	0.41		-0.79889	1.620362

In the case of the non poor in both cases, women are more likely referred to the provincial hospital (see figures 9a and 9b).

Figure 9a

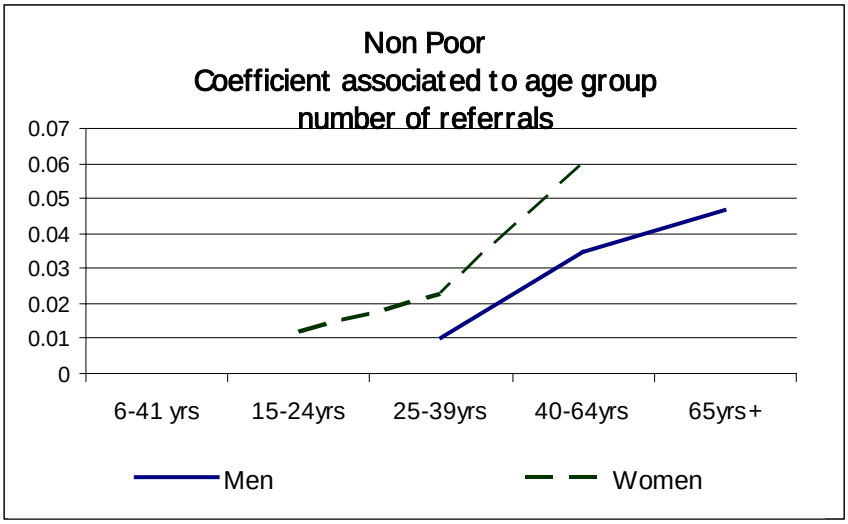
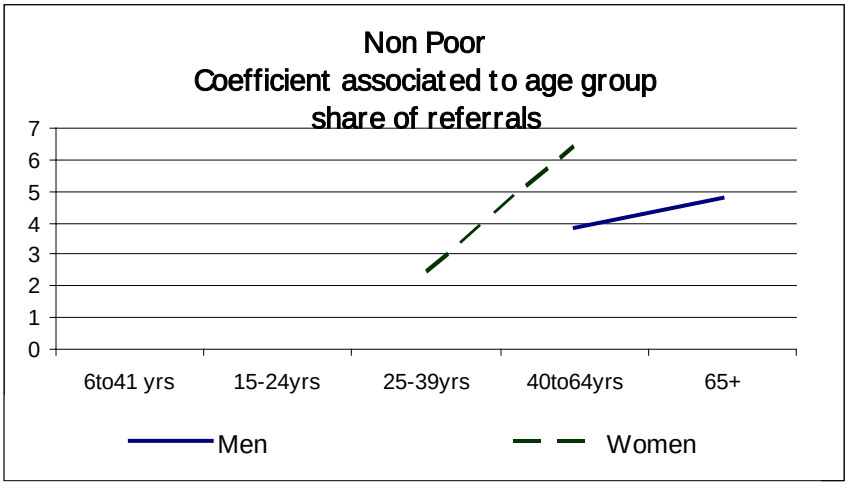


Figure 9b



Finally, health insurance since 2008 reimburses part of the cost of transportation in case of referral to the provincial hospital of Kon Tum. The subsidy is calculated on the total distance and the distances that need to be made on different types of road. Based on the tables VSS has established accordingly, four variables have been tested: the total distance from the commune of residence to Kon Tum, the distance made on bad roads, very bad roads and extremely bad roads. The number of referrals per insured or the share of referrals in the visits per insured is negatively associated to the distance from the commune of residence to Kon Tum that has to be made on road of very bad conditions. The coefficient associated to the total distance from the commune to Kon Tum is not significant. These results suggest that the policy could have had a positive impact to reduce the barriers due to the distance or that distance (except on very bad roads) is not an important impediment to seek health care to the provincial hospital of Kon Tum.

5. Final remarks

All these findings downplay the factors related to cultural backgrounds or distance and suggest that financial barriers are the most important barrier to the use of health care services by the poor. The inequality in the treatment received by patients with the same disease and of about the same health conditions indicate that the major problem is the payment of the costs that are not covered by health insurance.

Many reasons explain the differences between the fees reimbursed by heath insurance and the cost hospitals want to charge. The issue is complex but the existence of an important gap is not surprising given that health insurance fees have not been revised since 2005 and that, in a context of increasing budget autonomy, hospitals have to find additional sources of income to finance rapid wage increases, raising prices of drugs, and the modernization of their equipment.

Health insurance is currently producing deficits. The increase of the reimbursement fees will likely increase that deficit. The lack of increase seems, by contrast, help reduce the financial imbalance. The lack of adjustment of the health insurance fees in fact slowly makes the system disappear. First, unless the income per capita of the subsidized group increase as fast as health costs, the regular increase of the portion of the costs that are not covered by health insurance increase the financial barriers the poor face to use health care. As time passes by, inequalities in the use of health care and, particularly, in the treatments provided to the population are growing. Second, unless the income per capita of the non poor increases at a slower pace than health costs, the portion of the health costs covered by health insurance becomes more and more negligible for the non poor. As time passes by, non poor are using less and less health insurance (like in the province of Kon Tum in the districts outside the city of Kon Tum). In the best case, health insurance is not expensive but it is useful nor for the poor nor for the

non poor. In the worse case, its inefficiency generates opposition to any reform that aims at increasing its financial resources.

Health insurance managers are probably well aware of the gap between the "true costs" and the fees that are reimbursed. Because health costs increase are rapid and difficult to monitor and because the system is already in deficit, there are, however, important concerns that health care providers will take advantage of the increase of the fees to "abuse" the system. Different pricing methods are under study and adjustments are regularly postponed.

The current strategy has been, instead, to channel additional funds to health insurance through the buying of the health insurance cards for the poor, the near poor and next year the children under 6 years old. In the case of poor region like the province of Kon Tum, these additional funds will relieve hospitals' budget constrains (for which about 80% of the budget comes out of these subsidies). If the increases in the subsidies are in line with the recent increases in the local health costs, the inequalities will remain stable. Only larger increases could help reduce them. Such increase, however, raise again concerns about possible abuse or hospitals' use that do not target the reduction of the inequalities between insured.

Many of these concerns rely on believes that a large part of the current inequalities are due to cultural and other barriers like distance that are not related to the prices of health service. The analysis in Kon Tum did not observe that distance explains the low frequentation of the poor. It did not observe important difference either between the health care use of the members of the ethnic minorities and the workers of the informal sector and their families. These results do not mean that there are no differences in the use of health services due to cultural attitudes, difficulties to reach health care centers, and economic constrains. They rather suggest that at this stage of development the financial barriers imposed by hospitals appear to be the most important factor. Reducing these barriers can have important impact on welfare.

Only important additional funding will allow reduce the existing financial barriers that exist at the hospitals. Such transfers call cannot be realized, however, without guarantees that hospitals will effectively be use these additional funds to reduce the current inequalities[13]. One possibility would be to increase the amount reimbursed only when the patient is poor. Another solution could be to establish more sophisticated contracts between health insurance and health care providers

[13] Contrary to other policy goals, the objective of the policy in this context would not to reduce the effective out-of-pockets fees, mostly paid by the non poor, but increase the provision of treatment to the poor by reducing the amount of out-of-pocket fees they have to pay. To some extend, the impact of this policy is to increase the total amount of out-of-pockets fees, because it gives access to specific treatments to a part of the population that previously did not have access to and by so starts paying some (affordable) out-of-pocket fees.

that target particularly outcomes. Today, health insurance pre-funds hospitals on a quarterly basis according to the number and the type of insured that are registered to the facility. The balance between this funding and the effective amount of health insurance expenditures is settled at the end of each quarter. Major increase in such funding could be attached to specific expansion of certain services to targeted groups: number of acts of major surgery realized on poor peoples; number of poor women followed during pregnancy and giving birth at the hospital etc.; number of middle age poor people that benefit from laboratory exams. Obviously such policy encourages some over-prescription behavior. Given that seeking health care services impose indirect costs on the patient (food, transportation, lost of income opportunities and little gifts for helping friends and relatives and sometimes health care providers etc.), it is unlikely that the room for large over-prescription of treatment to the poor populations be very important in poor regions like the province of Kon Tum.